

Science report

Paediatrics: Feeds for newborn babies

A slight adjustment in the acidity of cows' milk fed to newborn babies increases the feed's resemblance to breast milk and very probably results in a healthier baby. That is the conclusion drawn by Dr V. C. Harrison and Dr G Peat of Cape Town University from tests on 100 babies in the first week of life.

Breast-fed babies do better than babies fed on cows' milk in two ways: they regain their birth weight more rapidly in the week after birth and are less prone to gastro-enteritis. Recent research has shown that the greater resistance of breast-fed babies to gastro-intestinal upsets is probably due to the effect of bacteria that flourish in the babies' guts. Now Dr Harrison and Dr Peat have shown that the improved weight gain of newborn babies fed on breast milk probably has the same cause.

The crucial difference between the two milks lies in the superiority of cows' milk as a growth medium for the bacterium *Escherichia coli*,

which causes stomach upsets. The difference is chiefly due to the greater acidity of cows' milk. Breast milk is less acid and therefore less favourable to the growth of *E coli*; also, it encourages the growth of harmless lactobacilli, which themselves tend to neutralize acid and make the environment even more unfavourable for *E coli*.

With that in mind, Dr Harrison and Dr Peat have tried the effect of decreasing acidity of cows' milk with either bicarbonate of soda or trometamol. They carried out tests using breast milk, reconstituted cows' milk, and reconstituted cows' milk with bicarbonate of soda or trometamol. The tests showed that breast milk and cows' milk corrected for acidity are significantly less effective than unmodified cows' milk as culture media for bacteria.

The acidity of feeds can also influence the rate at which babies gain weight. All babies lose weight during the first day or two of life, and indeed breast-fed babies tend to lose rather more than

bottle-fed babies because of the delay in the production of true milk by the mother.

But Dr Harrison and Dr Peat found that whereas breast-fed babies made up that initial loss within an average of 5.9 days after birth, bottle-fed babies took an average of 8.7 days. Bottle-fed babies with sodium bicarbonate added to the feed showed a pattern of weight gain much more like that of the breast-fed babies; the addition of trometamol had a similar but slightly less marked effect.

Statistical tests show that that is unlikely to be a chance difference, a conclusion further reinforced by the fact that when the trial period during which the alkali was added to the feeds ended, the babies on cows' milk lost a little weight.

At the same time, Dr Harrison and Dr Peat carried out tests on the infants' faeces to see if they showed the expected differences in bacterial content. The relative numbers of *E coli* and lactobacilli found in those tests faithfully reflected the acidity of the feeds.

Breast-fed infants had consistently low *E coli* counts and a preponderance of lactobacilli. Infants on cows' milk corrected for acidity showed a similar balance, but reverted to the typical pattern for artificially-fed babies when the neutralizing agents were withdrawn from their feeds after a week.

Dr Harrison and Dr Peat are convinced that their results are due to changes in the bacterial pattern in the babies' guts, and not to the correction of excess acidity in itself. Although they emphasize that their conclusions so far can be applied only to the first week after birth, it is clear that if the same effects can be expected on a longer term basis, that could have important implications for infant nutrition, particularly in areas where protein deficiency diseases are widespread.

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